

## FORAGE SUITABILITY GROUP

### Sand

**FSG No.:** G053CY300SD**Major Land Resource Area:** 53C - Southern Dark Brown Glaciated Plains

### Physiographic Features

The soils in this group are found on flood plains.

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	1300	2300
<b>Slope (percent):</b>	0	2
<b>Flooding:</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Ponding:</b>		
<b>Depth (inches):</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Runoff Class:</b>	Very low	Very low

### Climatic Features

This group occurs in a mid-continental climate characterized by wide seasonal temperature and precipitation fluctuations and extremes.

Annual precipitation varies widely from year to year in MLRA 53C. Average annual precipitation for all climate stations listed below is about 20 inches. About 75 percent of that occurs during the months of April through September. On average, there are about 28 days with greater than .1 inches of precipitation during the same timeframe. Annual precipitation and temperature increase from the north to the south in the MLRA.

Average annual snowfall ranges from 23 inches at Pickstown to 46 inches at Harrold. Snow cover at depths greater than 1 inch range from 38 days at Gettysburg to 65 days at Harrold.

Average July temperatures are about 75°F and average January temperatures are about 16°F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -40 and a high of 113 both recorded at Harrold. The MLRA lies mostly in USDA Plant Hardiness Zones 4a and 4b, with a small area of warmer 5a along the Missouri River.

At Huron, the closest station with records, the average annual wind speeds are about 11.5 mph. The highest wind speeds occur during March through May. It is cloudy about 154 days a year. Average morning relative humidity in June is about 86 percent and average afternoon humidity is 59 percent.

The climate data listed in the tables below represent high and low ranges and averages for the climate stations and dates listed. For additional climate data, access the National Water and Climate Center at <http://www.wcc.nrcs.usda.gov>.

	<b>From</b>	<b>To</b>
<b>Freeze-free period (28 deg)(days):</b> (9 years in 10 at least)	122	156
<b>Last Killing Freeze in Spring (28 deg):</b> (1 year in 10 later than)	May 24	May 07
<b>Last Frost in Spring (32 deg):</b> (1 year in 10 later than)	Jun 14	May 17
<b>First Frost in Fall (32 deg):</b> (1 year in 10 earlier than)	Aug 27	Sep 23
<b>First Killing Freeze in Fall (28 deg):</b> (1 year in 10 earlier than)	Sep 16	Oct 04
<b>Length of Growing Season (32 deg)(days):</b> (9 years in 10 at least)	85	136

	<b>From</b>	<b>To</b>
<b>Growing Degree Days (40 deg):</b>	4388	5543
<b>Growing Degree Days (50 deg):</b>	2532	3338
<b>Annual Minimum Temperature:</b>	-30	-15
<b>Mean annual precipitation (inches):</b>	17	25

**Monthly precipitation (inches) and temperature (F):**

<b>2 years in 10:</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
<b>Precip. Less Than</b>	0.10	0.13	0.55	1.00	1.21	1.40	1.26	1.02	0.46	0.47	0.15	0.19
<b>Precip. More Than</b>	0.62	0.83	2.36	3.48	4.20	5.55	3.95	3.29	3.60	2.43	1.49	0.94
<b>Monthly Average:</b>	0.40	0.55	1.38	2.23	2.88	3.25	2.74	2.21	1.78	1.37	0.70	0.55
<b>Temp. Min.</b>	1.3	7.5	18.2	31.1	42.2	52.3	58.2	55.5	44.9	32.8	18.9	6.1
<b>Temp. Max.</b>	30.1	35.8	47.6	63.8	75.1	85.3	91.1	88.7	78.0	65.5	47.0	32.9
<b>Temp. Avg.</b>	15.7	21.9	32.8	47.3	58.6	68.5	75.1	72.9	62.2	49.8	33.5	19.6

<b><u>Climate Station</u></b>	<b><u>Location</u></b>	<b><u>From</u></b>	<b><u>To</u></b>
SD6574	Pickstown, SD	1961	1990
SD8767	Wagner, SD	1961	1990
SD3294	Gettysburg, SD	1961	1990
SD3608	Harrold, SD	1963	1990
SD0043	Academy, SD	1961	1990
SD6292	Onida, SD	1961	1990
SD3832	Highmore, SD	1961	1990
SD7992	Stephan, SD	1961	1990

**Soil Interpretations**

This group consists of very deep, excessively drained, coarse textured soils formed in sandy alluvial materials on flood plains. Permeability is rapid.

<b>Drainage Class:</b>	Excessively drained	To	Excessively drained
<b>Permeability Class:</b>	Rapid	To	Rapid
(0 - 40 inches)			
<b>Frost Action Class:</b>	Low	To	Low

	<b><u>Minimum</u></b>	<b><u>Maximum</u></b>
<b>Depth:</b>	72	
<b>Surface Fragments &gt;3" (% Cover):</b>	0	0
<b>Organic Matter (percent):</b>	0.0	0.5
(surface layer)		
<b>Electrical Conductivity (mmhos/cm):</b>	0	0
(0 - 24 inches)		
<b>Sodium Absorption Ratio:</b>	0	0
(0 - 12 inches)		
<b>Soil Reaction (1:1) Water (pH):</b>	6.6	7.3
(0 - 12 inches)		
<b>Available Water Capacity (inches):</b>	3	6
(0 - 60 inches)		
<b>Calcium Carbonate Equivalent (percent):</b>	0	3
(0 - 12 inches)		

## Adapted Species List

The following forage species are considered adapted to grow on the soils in this group. Additional information concerning plant characteristics of a number of the listed species as well as individual cultivars of many those species can be accessed at <http://plants.usda.gov/>

### Cool Season Grasses

Altai wildrye	F
Canada wildrye	G
Crested wheatgrass	F
Green needlegrass	F
Intermediate wheatgrass	G
Meadow brome	G
Newhy hybrid wheatgrass	G
Pubescent wheatgrass	G
Russian wildrye	F
Slender wheatgrass	F
Smooth brome	F
Tall wheatgrass	F
Western wheatgrass	F

### Warm Season Grasses

Big bluestem	F
Indiangrass	F
Little bluestem	G
Prairie sandreed	G
Sand bluestem	G
Sideoats grama	F
Switchgrass	F

### Legumes

Alfalfa	F
Canada milkvetch	F
Cicer milkvetch	G
Purple prairieclover	G
Sainfoin	F
Sweetclover	F
White prairieclover	G

G - Good adaptation for forage production on this group of soils in this MLRA

F - Fair adaptation but will not produce at its highest potential

## Production Estimates

Production estimates listed here should only be used for making general management recommendations. Onsite production information should always be used for making detailed planning and management recommendations.

The high forage production estimates listed below are based on dense, vigorous stands of climatically adapted, superior performing cultivars. They are properly fertilized for high yields and pest infestations are kept below economic thresholds. Mechanical harvests are managed to maintain stand life by cutting at appropriate stages of maturity and harvest intervals. If grazed, optimum beginning and ending grazing heights are adhered to. Adequate time is allowed for plant recovery before entering winter dormancy under both uses.

The production estimates listed below represent total annual above ground plant production on an air-dry-matter basis. Estimates of hay and grazing yields can be calculated from these numbers by multiplying them by a harvest efficiency. A 70 percent harvest efficiency is commonly used when converting to hay yields. Pasture harvest efficiency is highly dependent on the grazing management system applied, ranging from 25 to 50 percent.

### Forage Crop

### Management Intensity

	<u>High</u> (lbs/ac)	<u>Low</u> (lbs/ac)
Alfalfa	4600	2300
Alfalfa/Intermediate wheatgrass	3600	1800
Intermediate wheatgrass	3100	1800
Sand bluestem	4600	2000

## Forage Growth Curves

Growth curves estimate the seasonal distribution of growth of the various forage crops. They indicate when the forages may be available for grazing or mechanical harvest.

**Growth Curve Number:** SD0001  
**Growth Curve Name:** Alfalfa  
**Growth Curve Description:** Alfalfa, MLRAs 107, 102B, 63B, 66, 65

### Percent Production by Month

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	0	5	30	25	20	15	5	0	0	0

**Growth Curve Number:** SD0004  
**Growth Curve Name:** Cool season grass  
**Growth Curve Description:** Cool season grass, statewide

### Percent Production by Month

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	0	10	40	30	10	5	5	0	0	0

**Growth Curve Number:** SD0005  
**Growth Curve Name:** Warm season grass  
**Growth Curve Description:** Warm season grass, statewide

### Percent Production by Month

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	0	0	10	40	35	15	0	0	0	0

## Soil Limitations

Soil blowing is a severe hazard during establishment or renovation of forage stands on the soils of this group. Bare areas where livestock concentrate are also susceptible. Production potential is low to moderate due to the low available water capacity and droughtiness of these soils. Also, these soils are typically low in native fertility and have reduced capacity to supply plant nutrients. Species choices are somewhat limited for pasture and hayland for these same reasons.

## Management Interpretations

The impact on yields of the low available water capacity of these soils can be reduced by selecting forage species that are highly tolerant to periods of drought and inadequate soil moisture and that can grow on coarse textured soils. Incorporate wind erosion control practices during stand establishment. Properly locating facilitating practices such as fences, lanes, and water developments can help control livestock movement, reduce trailing perpendicular to steeper slopes, evenly distribute grazing pressure, and reduce bare areas.

## FSG Documentation

### Similar FSG's:

<u>FSG ID</u>	<u>FSG Narrative</u>
G053CY130SD	Very Droughty Loam soils have finer textures than sands.

## Inventory Data References

Agriculture Handbook 296-Land Resource Regions and Major Land Resource Areas  
Natural Resources Conservation Service (NRCS) National Water and Climate Center data  
National Soil Survey Information System (NASIS) for soil surveys in South Dakota counties in MLRA 53C  
NRCS South Dakota Technical Guide  
NRCS National Range and Pasture Handbook  
Various Agricultural Research Service, Cooperative Extension Service, and NRCS research trials for plant adaptation and production

## Forage Suitability Group Approval

**Original Author:** Tim Nordquist  
**Original Date:**  
**Approval by:** Dave Schmidt  
**Approval Date:** 2/7/03